

08-23-00

A.

PATENT APPLICATION  
Docket No.: 42085-00027  
FPCH99160016US

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re patent application of: WU, Wenqing

For: IMPROVEMENT IN A FLUIDISED BED POLYMERIZATION REACTOR

**CERTIFICATE OF MAILING BY EXPRESS MAIL**

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Date of Deposit: Aug 22, 2000

I hereby certify that the paper(s) and/or fee(s) listed below are attached hereto and are being deposited with the U.S. Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner of Patents, Washington, D.C. 20231

Type or Print Name: Dorothy Mackinnon

Signature

BOX PATENT APPLICATION  
Assistant Commissioner of Patents  
Washington, D.C. 20231

Sir:

**PATENT APPLICATION TRANSMITTAL LETTER**

Transmitted herewith for filing, please find the following:

1. (XX) The specification of the above-referenced patent application is enclosed herewith ( 8 page(s) including claim(s) and Abstract).

2. (XX) Three (3) sheet(s) of:  
\_\_\_ informal drawing(s) is (are) enclosed herewith.  
X formal drawing(s) is (are) enclosed herewith.

3. ( ) This application is a:  
\_\_\_ Continuation  
\_\_\_ Divisional  
\_\_\_ Continuation-In-Part  
of prior copending parent application

Serial No. \_\_\_\_\_ filed on \_\_\_\_\_, now pending.

Please amend the application to insert the following line in the beginning of the specification:

--This application is a Continuation of prior application Serial No. \_\_\_\_\_ filed on \_\_\_\_\_, now pending.--

In the event that a petition to extend time under 37 CFR 1.136 is necessary in the parent application to maintain copendency for this application, a petition for an extension of the necessary time to maintain copendency is hereby requested for the parent application and the Commissioner is hereby authorized to debit our Account Number 10-0447 for the necessary fees.

4. (X) The fees for this application have been calculated and included as shown below (Prior to calculating the fees, please enter any enclosed preliminary amendment.):

	NO. FILED	NO. EXTRA	RATE	FEE
<b>BASIC FEE</b>				<b>\$690</b>
<b>TOTAL CLAIMS</b>	<b>3-20</b>	<b>0</b>	<b>\$18</b>	<b>0</b>
<b>INDEPENDENT CLAIMS</b>	<b>1-3</b>	<b>0</b>	<b>\$78</b>	<b>0</b>
<b>MULTIPLE DEPENDENT CLAIM(S) PRESENTED</b>			<b>\$260</b>	
<b>TOTAL FEES:</b>				<b>\$690.00</b>
<b>Deduct One-Half for Small Entity Status</b>				
<b>Assignment Recordal Fee</b>			<b>\$40</b>	<b>40.00</b>
<b>TOTAL AMOUNT DUE:</b>				<b>\$730.00</b>

X Check(s) in the amount of \$ 690 and \$ 40 are enclosed herewith. Please charge any deficiency or credit any overpayment to Deposit Account No. 10-0447.

— Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_. Please charge any deficiency or credit any overpayment to Deposit Account No. \_\_\_\_\_.

5. (X) An oath or declaration is enclosed herewith that is:

— Unsigned

X Newly executed per 37 CFR 1.63(a) and (b).

— A copy of the executed declaration filed in the prior application upon which priority is based, showing the signature or an indication thereon that it was signed; and:

— This application is being filed fewer than all of the inventors named in the prior application and it is requested that the following name or names be deleted from the list of inventors in the prior application for this continuation or divisional application:

— The prior application was accorded status under 37 CFR § 1.47 and is accompanied by:

- A copy of the decision granting a petition to accord Sec. 1.47 status to the prior application (unless all of the inventors have or legal representatives have filed an oath or declaration to join in the prior application).
- A copy of the subsequently executed oath(s) or declaration(s) filed by the inventor(s) or legal representative(s) that have subsequently joined in the prior application.

6. (X) The power of attorney for this application:  
X is appointed in the newly executed Oath or Declaration submitted herewith.  
 — is appointed by the power of attorney enclosed herewith.  
 — remains the same as originally in the parent application.  
 — was changed during the prosecution of the parent application and a copy of the change in the power of attorney is enclosed herewith.

7. (XX) The correspondence address for this application shall be:  
 Stanley R. Moore, Esq.  
 Jenkins and Gilchrist, P.C.  
 3200 Fountain Place  
 1445 Ross Ave.  
 Dallas, Texas 75202  
X which is a new correspondence address or a change therein.  
 — which is the same as originally in the parent application.  
 — which is the change in the correspondence address that was filed during the prosecution of the parent application.

8. (X) Priority is hereby claimed under 35 USC 119 and 172 to the following foreign applications:

Country	Serial No.	Date
<u>China</u>	<u>CN99118186.7</u>	<u>30 August 1999</u>
_____	_____	_____
_____	_____	_____

and:

- X A certified copy of each application is enclosed herewith.
- A certified copy of each application was filed in prior application Serial No. \_\_\_\_\_.

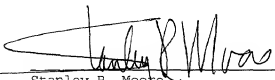
9. ( ) A verified statement claiming small entity status under 37 CFR 1.9 and 1.27:  
 — is enclosed herewith.  
 — was filed in parent application Serial No. \_\_\_\_\_, and such status remains unchanged and is requested for this application.

10. ( ) A preliminary amendment is enclosed herewith.

00220-1040490

11. ( X ) An Information Disclosure Statement with Modified PTO Form 1449 and a copy of the cited references are enclosed herewith.
12. (XX) An Assignment of the invention to CHINA PETROCHEMICAL CORPORATION and TIANJIN UNITED CHEMICAL CORPORATION with cover sheet and recordation fee is enclosed herewith for recordation by the Assignment Branch.
13. (XX) The Commissioner is hereby authorized to charge payment, or to credit any overpayment, of the following fees associated with this filing or during the pendency of this application to Deposit Account No. 10-0447.
- X Any patent application filing fees under 37 CFR 1.16.
  - X Any patent application processing fees under 37 CFR 1.17.
  - The issue fee under 37 CFR 1.18 at or before mailing of the Notice of Allowance, pursuant to 37 CFR 1.311(b).
14. ( ) Other (specify): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
15. (XX) Confirmation Postcard.

Respectfully submitted,

  
\_\_\_\_\_  
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Reg. No. 26,958

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FPCH99160016

## IMPROVEMENT IN A FLUIDIZED BED POLYMERIZATION REACTOR

### Field of the Invention

The present invention relates to the improvement for a fluidized bed polymerization reactor. More particularly, it relates to the improvement for a flow deflector at the bottom of a fluidized bed polymerization reactor.

When an exothermic polymerization reaction is conducted in a fluidized bed reactor, the reaction rate is to be restricted so as to have time enough for removing the released heat from the fluidized bed. A method to raise the removal rate of the reaction heat is to compress and cool the gas in a monomer state that is needed to recycle back to the reactor so that it is partially condensed. The liquid generated is entrained by the recycle monomer gas stream and returns to the reactor together with the gas stream. This is referred to as the "condensing mode" operation of a polymerization reaction. U.S. Patent Nos. 4,543,399 and 4,588,790 to Jenkins et al. disclose this operation method, which point out that this "condensing mode" operation allows a reduction in the temperature of the recycle gas stream and that the evaporation of the liquid requires absorption of heat. The combination of the two functions allows much higher space-time-yields in this mode than those in the "non-condensing mode".

The above operation modes both require the use of different inlet devices of the reactor, therefore the reactor has to be shut down for converting the inlet device when the interchange between the two operation modes is required. To solve this problem and further raise the productivity of the fluidized bed reactor, Chinese Patent Application No. 85106978 to UCC of U.S.A discloses a novel reactor inlet device - flow deflector. This flow deflector is installed under the distributor plate of the fluidized bed reactor and provides two fluid flow paths for the fluid to enter the mixing chamber, a first fluid flow path along the wall of the mixing chamber and a second upwardly fluid flow path. The preferred flow deflector is an annular flow deflector, having aperture for providing a central, upwardly oriented fluid flow path. Besides, it also provides a peripheral fluid flow path around the flow deflector and along the wall of the mixing chamber. It is claimed that during the operation of the flow deflector with such a structure, the build-up of the solid particles and the agglomeration of the liquid in the mixing chamber is prevented by sweeping the wall of the mixing chamber with the gas stream entering through the annular outer second fluid flow path peripherally around the annular flow deflector. As shown by the arrows in Figs. 1 and 2 of this literature, the central upward gas stream is mixed with the peripheral gas flow and thereby a more uniform distribution of any liquid and/or solid in the gas flow is guaranteed.

However, according to our practice in many years' operation of this kind of annular flow deflector commonly adopted by the Unipol fluidized bed polymerization reactor imported from UCC, we found that this kind of flow deflectors have the

following disadvantages when operated in the condensing mode:

1. Gas is non-uniformly distributed. The flow of the central gas flow is so great, and the velocity is so high that the recycle stream and the powders and liquid entrained by the stream lash directly at the lower surface of the distributor plate. If the recycle stream entrains polymer lumps, the polymer lumps smaller than  $\phi 16$  mm would enter the holes of the distributor plate under the action of high speed stream and result in plugging. By contract, the velocity of the stream within the annular zone 500 mm from the periphery of the distributor plate along the radius direction would reduce, resulting in plugging in the distributor plate due to the frequent deposition of powders.

2. Deposited powders are likely to agglomerate into flakes. Because the area of the upper surface (i.e., the opposite of the flow direction of the recycle stream) of the flow deflector is relatively large and the stream flows through the central hole and the peripheral path of the annular flow deflector respectively, so the zone above this surface is a dead "zone" and powders often deposit. When the temperature of the inlet stream is high enough for the powders to soften and stick, flaky polymers with the same area as that of the upper surface of the annular flow deflector would form. When the reactor is operated in the condensing mode, these flakes fall off due to impact and soak by liquid and then lash at the distributor plate after being crushed by the impact of the stream, resulting in plugging.

3. The range of the amount of the condensing agent is narrow. For this kind of flow deflector, the amount of the condensing agent is restricted to a range of 3~10wt%. This kind of flow deflector is not suitable to a greater amount of condensing agent.

Therefore, the present invention makes a bold improvement in the structure of the flow deflector. It is proved by the practical application that the flow deflector of the present invention has completely overcome the above disadvantages of the flow deflector in the prior art. Safe and stable operation is realized with a liquid content of the recycle stream in the range of 3~25wt%. Because the amount of the condensed agent increases, the heat removal increases, so that the space-time-yield can further increase to 200% of the originally designed capacity.

For this reason, the present invention provides a novel fluidized bed reactor, which comprises:

- d. a distributor plate under the fluidized section of the reactor;
- e. a mixing chamber formed by confining the reactor space under the distributor plate with said distributor plate; and
- f. a flow deflector installed under the distributor plate and at the entry of the reactor bottom, characterized in that the flow deflector comprises an annular plate and a conic plate,
  - the annular plate being positioned above the reactor bottom entry with a hole diameter of  $D_1$  by spacers, the said annular plate having a central hole with a diameter of  $D_2$ ; and
  - the conic plate being located above the annular plate, concentric with the annular plate and supported on the annular plate by spacers, the conic plate being a reversed

cone with a cone angle of  $\alpha$  to the horizontal plane and having a central hole with a hole diameter of  $D_3$ ;

the minimum section area between the annular plate and the reactor bottom being  $S_1$ , the minimum section area between the annular plate and the conic plate being  $S_2$ , and the circular area of the central hole of the conic plate being  $S_3$ ;

the flow deflector being adapted to provide at least three paths for the gas stream to enter the mixing chamber, i.e., a first upwardly fluid flow path through the entry  $D_1$  of the reactor bottom and section  $S_1$  and along the wall of the mixing chamber, a second upwardly fluid flow path through the central hole  $D_2$  of the annular plate and section  $S_2$  below the conic plate and towards the side wall, and a third upwardly fluid flow path through the central hole  $D_3$  of the conic plate.

The above characters of the present invention and the advantages of the invention over the prior art are described in detail referring to the following Figures:

### Brief Description for Drawings

Fig. 1 is the elevational view in cross-section of the bottom of the fluidized bed reactor employed in the prior art, including: distributor plate, mixing chamber and flow deflector;

Fig. 2 is the enlarged view of the entry conduit and flow deflector in Fig.1;

Fig. 3 is the elevational view in cross-section of the bottom of the fluidized bed reactor employed in the present invention, including: distributor plate, mixing chamber and flow deflector; and

Fig. 4 is the enlarged view of the entry conduit and flow deflector in Fig.3.

### Detailed Description of the Invention

As shown in Figs. 3 and 4, the annular plate 3 is positioned above the entry conduit 1 of the reactor bottom by spacers 2, and the conic plate 5 is positioned on the annular plate 3 by spacers 4. The recycle stream entering from the entry conduit 1 passes through the minimum section  $S_1$  under the leading of the periphery of the annular plate 3 and forms the upward gas flow I along the wall of mixing chamber, which would impact the liquid falling back from the wall of the mixing chamber due to the actions of the gravity and the wall, thus, preventing the liquid from being accumulated at the reactor bottom and on the wall of the mixing chamber; another portion of the recycle stream passes through the central hole  $D_2$  of the annular plate and the minimum section  $S_2$  and forms flow II flowing towards the side along the direction of cone angle  $\alpha$  under the leading of the periphery of the conic plate 5, which would impact the upper surface of the annular plate and at the same time, form shear and impact with flow I and thereby re-entrains and re-atomizes the liquid departing from entraining and falling back to make it suspend in the gas stream; another portion of the stream passing through the central hole of the annular plate 3 continues flowing upwards and passes through the central hole  $D_3$  of the conic plate 5 to form flow III, which flows directly towards the distributor plate but the impact against the distributor plate is weakened due to the shunting action of stream II, and forms shear, impact, and mixing with streams I and II in the mixing chamber, thereby further re-atomizes and re-entrains the separated liquid, allowing any of the liquid and/or solid in the whole space under the distributor plate of the reactor to realize

perfect mixing and leaving no dead corner as indicated by the arrows in the Figures, and thereby permitting thorough and uniform distribution of the gas flow when it passes through the distributor plate and enters the fluidized bed.

The structural sizes and parameters of each assembly of the flow deflector can be selected within the following ranges:

1. The ratio of the hole diameter of the conic plate, annular plate, and the entry conduit of the reactor bottom

$D_1$  - hole diameter of the entry conduit

$D_2$  - hole diameter of the central hole of the annular plate

$D_3$  - hole diameter of the central hole of the conic plate

$D_1/D_2 = 1.2 - 1.6$ , preferably  $D_1/D_2 = 1.44$

$D_2/D_3 = 1.5 - 2.0$ , preferably  $D_2/D_3 = 1.77$

2. The ratio of the path section area

$S_1$  - The minimum annular section area passed by gas flow I

$S_2$  - The minimum annular section area passed by gas flow II

$S_3$  - The minimum circular area passed by gas flow III

$S_1/S_2 = 3.8 - 4.4$ ; preferably  $S_1/S_2 = 4.28$

$S_2/S_3 = 2.0 - 3.5$ ; preferably  $S_2/S_3 = 2.74$

3. Resistance drop of the flow deflector

The resistance drop of the flow deflector  $\Delta P$  is calculated based on the total flow area of the flow deflector.

$\Delta P = 7.0 - 16$  kPa, preferably 11 kPa

4. Cone angle of the conic plate  $\alpha$

$\alpha = 30 - 60^\circ$ , preferably  $\alpha = 45^\circ$ . Wherein the conic plate may adopt other shapes similar to a cone.

The flow deflector of the present invention has the following advantages over that of the prior art.

1. Allowing the liquid stream and powders to uniformly distribute in the gas phase after the recycle stream enters the mixing chamber, alleviating the impact force of the gas flow through the central hole against the distributor plate and making it difficult for the entrained polymer lumps to enter the distribution holes of  $\phi 16$ .

2. The atomization of the liquid is more uniform. The conic ring of 45 degrees strengthens the impact, friction and shear in the direction of tilted side and the group of the liquid drops is re-atomized and suspended in the ascending stream, uniformly passing through the distributor plate and entering the reactor.

3. The deposition of the powders in the region within the annular zone 500 mm from the periphery of the distributor plate along the radius direction decreases because the flow in the side direction of 45 degree increases and thereby the plugging probability reduces.

4. The stream in the side direction of 45 degree no longer allows the powders to deposit on the upper surface of the flow deflector and therefore the flow deflector always maintains clean, having no "dead zone" and sticky flakes.

5. The throttling effect is better because the resistance drop increases by 11 kPa and the atomizing effect is improved.



6. Safe and stable operation is possible even when the liquid content is in the range of 3-25wt%, and the space-time-yield of the reactor will further rise to 200% of the originally designed value. The period of continuous operation for the reactor is increased to over twice of the original one.

The condensing agents employed in the present invention include volatile liquid saturated hydrocarbons, such as iso-pentane and n-hexane, but cyclopentane is preferred. This is the major inventive point of another application No.99118185.9 (Docket No. FPCH99160015) jointly owned and copending with the present invention, the complete content of which is incorporated herein for reference.

The catalysts employed in the present invention include: coordinated anionic catalysts, cationic catalysts, free radical catalysts, and also include components of transition metals or metallocene and double peak product catalysts.

#### **Example**

A Unipol fluidized bed reactor imported from UCC for olefin polymerization was employed, at the bottom of which a flow deflector of the present invention as shown in Figs. 3 and 4 had been installed. It was operated in the condensing mode to produce low density polyethylene.

1. The run data of the DGM-1820 low density product

Reaction feedstock: ethylene, butene-1, and hydrogen

Flow of the recycle stream: 552000 kg/h

Liquid content in the recycle stream: 10 - 22wt%

Space-time-yield: 180-230 kg/h·m<sup>3</sup>

Product produced: low-density film product DGM-1820

Catalyst:  $\alpha$  type

2. Situations after 18 months of continuous operation

The flow of the recycle stream was stable without fluctuation, proving that the atomization by the flow deflector was uniform.

There was no increase in the pressure drop of the distributor plate, which always maintained between 15-25 kPa, showing that there was no plugging in the distributor plate.

The temperatures at the four monitoring spots on the distributor plate were very uniform, temperature difference between any two spots being smaller than 0.05°C, showing that there was no plugging in the distributor plate and that the fluidizing state of the resin bed was good.

The total content of the liquid in the recycle stream reached 31wt% temporarily and the operation of the reactor was still stable.

3. Situations inspected after 18 months of continuous operation

The part above the annular plate had not any powders and flakes and it was very clean and showed metal luster.

There were no depositing, hanging and adhesion of powders from the annular zone along the radius direction of 500 mm from the outer periphery of the lower surface of the distributor plate to the whole lower surface of the distributor plate. This part was very clean.

There was no plugging in 679 holes of  $\phi 16$  of the distributor plate.

Sizes of the reactor and flow deflector:

Sizes of the reactor: diameter: 3.05 m; height of the cylindrical section 12 m.

Sizes of the flow deflector:  $D_1 = 467$  mm;  $D_2 = 330$  mm;  $D_3 = 186$  mm.

The results show that no operation problem and unfavorable effect on the product are observed in the production run when the flow deflector of the present invention is used. Safe and stable operation is possible when the liquid content in the gas flow is in the range of 3-25wt%. This shows that, with so high liquid contents, the liquid can still be entrained and atomized very well without accumulation at the bottom of the reactor and flooding. Inspection after shut down, has observed no plugging in the distributor plate due to the build-up of the resin and the wall of the mixing chamber and the surface of the flow deflector is clean.

# CLAIMS

1. A fluidized bed reactor, which comprises:
  - a. a distributor plate under the fluidized section of the reactor;
  - b. a mixing chamber formed by confining the reactor space under the distributor plate with said distributor plate; and
  - c. a flow deflector installed under the distributor plate and at the entry of the reactor bottom, characterized in that the flow deflector comprises an annular plate and a conic plate,

the annular plate being positioned above the reactor bottom entry with a hole diameter of  $D_1$  by spacers, the said annular plate having a central hole with a diameter of  $D_2$ ; and

the conic plate being located above the annular plate, concentric with the annular plate and supported on the annular plate by spacers, the conic plate being a reversed cone with a cone angle of  $\alpha$  to the horizontal plane and having a central hole with a hole diameter of  $D_3$ ;

the minimum section area between the annular plate and the reactor bottom being  $S_1$ , the minimum section area between the annular plate and the conic plate being  $S_2$ , and the circular area of the central hole of the conic plate being  $S_3$ ;

the flow deflector being adapted to provide at least three paths for the gas stream to enter the mixing chamber, a first upwardly fluid flow path through the entry  $D_1$  of the reactor bottom and section  $S_1$  and along the wall of the mixing chamber, a second upwardly fluid flow path through the central hole  $D_2$  of the annular plate and section  $S_2$  below the conic plate and towards the side wall, and a third upwardly fluid flow path through the central hole  $D_3$  of the conic plate.

2. A reactor of claim 1, wherein the structural sizes and parameters of each assembly of the flow deflector are as follows:

$$\alpha = 30 - 60^\circ ;$$

$$D_1/D_2 = 1.2 - 1.6;$$

$$D_2/D_3 = 1.5 - 2.0;$$

$$S_1/S_2 = 3.8 - 4.8;$$

$$S_2/S_3 = 2.0 - 3.5; \text{ and}$$

the resistance drop of the flow deflector

$$\Delta P = 7.0 - 16 \text{ kPa.}$$

3. A reactor of claim 2, wherein the structural sizes and parameters of each assembly of the flow deflector are as follows:

$$\alpha = 45^\circ ;$$

$$D_1/D_2 = 1.44; D_2/D_3 = 1.77;$$

$$S_1/S_2 = 4.28;$$

$$S_2/S_3 = 2.74; \text{ and}$$

$$\Delta P = 11 \text{ kPa.}$$

**ABSTRACT**

A novel flow deflector employed in a fluidized bed reactor for olefin polymerization is disclosed, which is installed on the entry conduit of the reactor, comprising an annular plate and a cone plate and providing at least three paths for the recycle stream to enter the mixing chamber, thereby permitting all the liquid and/or solid material to achieve a more complete and uniform mixing.

09613494-032220-4643-960

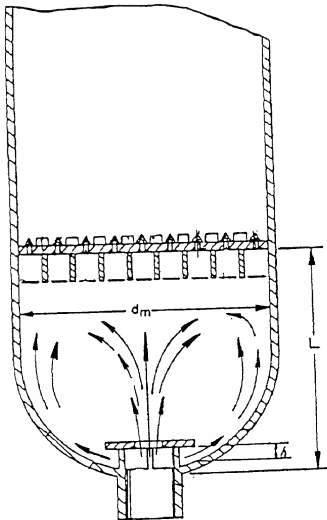


Fig. 1

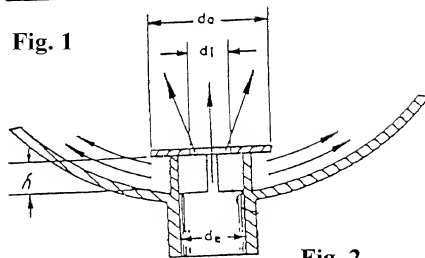


Fig. 2

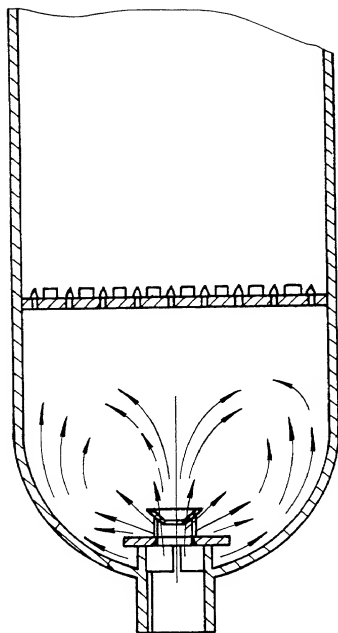


Fig. 3

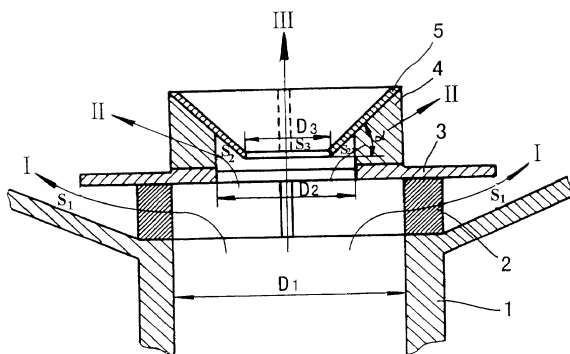


Fig. 4

**RULES 63 AND 67 (37 C.F.R. 1.63 and 1.67)  
DECLARATION AND POWER OF ATTORNEY**

**FOR UTILITY/DESIGN/CIP/PCT NATIONAL APPLICATIONS**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

and

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: IMPROVEMENT IN A FLUIDIZED BED POLYMERIZATION REACTOR, the specification of which: (mark only one)

- |              |     |   |
|--------------|-----|---|
| <u>  X  </u> | (a) | is attached hereto.   |
| <u>     </u> | (b) | was filed on <u>     </u> as Application Serial No. <u>     </u> and was amended on <u>     </u> (if applicable)                  |
| <u>     </u> | (c) | was filed as PCT International Application No. PCT/ <u>     </u> on <u>     </u> and was amended on <u>     </u> (if applicable). |
| <u>     </u> | (d) | was filed on <u>     </u> as Application Serial No. <u>     </u> and was issued a Notice of Allowance on <u>     </u> .           |
| <u>     </u> | (e) | was filed on <u>     </u> and bearing attorney docket number <u>     </u>   |

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above or as allowed as indicated above.

I acknowledge the duty to disclose all information known to me to be material to the patentability of this application as defined in 37 CFR § 1.56. If this is a continuation-in-part (CIP) application, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose to the Office all information known to me to be material to patentability of the application as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

I hereby claim foreign priority benefits under 35 U.S.C. § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate filed by me or my assignee disclosing the subject matter claimed in this application and having a filing date (1) before that of the application on which my priority is claimed or, (2) if no priority is claimed, before the filing date of this application:



PRIOR FOREIGN PATENTS

Number	Country	Month/Day/Year	Date first	Date	Priority Claimed
		Filed	laid-open or Published	patented or Granted	Yes No
CN99118186.7	China	30 Aug 1999			X

I hereby claim the benefit under 35 U.S.C. § 120/365 of any United States application(s) listed below and PCT international applications listed above or below:

PRIOR U.S. OR PCT APPLICATIONS

Application No. (series code/serial no.)	Month/Day/Year Filed	Status (pending, abandoned, patented)
NONE		

I hereby appoint:

TIMOTHY C. ACKERMANN, Reg. No. 44,493	RUSSELL J. GENET, Reg. No. 42,571	DANIEL G. NGUYEN, Reg. No. 42,933
THOMAS E. ANDERSON, Reg. No. 37,063	J. KEVIN GRAY, Reg. No. 37,141	SPENCER C. PATTERSON, Reg. No. 43,849
BENJAMIN J. BAL, Reg. No. 43,481	STEVEN B. GREENFIELD, Reg. No. 38,166	RUSSELL N. RIPPAMONTI, Reg. No. 39,521
MICHAEL I. BLANKSTEIN, Reg. No. 37,097	J. PAT REFTIG, Reg. No. 40,643	STEPHEN G. RUDISILL, Reg. No. 20,087
MARY JO BOLDING, Reg. No. 34,713	SHARON A. ISRAEL, Reg. No. 41,867	HOLLY L. RUDNICK, Reg. No. 43,065
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